

VOCATIONAL GUIDANCE OF THE BLIND

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Vocational Guidance of the Blind

SUBODH CHANDRA ROY

The callous social neglect of over a million or so of the blind in India makes their lives a tragic burden and a curse to themselves. In this article, Prof. S. C. Roy, holding that blindness is a physical handicap and not a calamity, as is often thought to be the case, offers useful suggestions for training the blind to overcome their personality and vocational disabilities and take their place as honourable members of society.

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THE vocational guidance movement for adolescents may, broadly speaking, be said to have been initiated in 1908. From the ever-growing momentum that has accrued to this concept as well as from the mighty bulk of literature that has been written on this subject in course of less than four decades, the usefulness and the popularity of this movement may easily be realised. So far as the blind are concerned, this work attracted the serious attention of those active in this field during the last 15 years. Owing to the comparatively short time, the narrower range of occupational opportunities for the blind, and a few other important factors, progress in this phase of blind work has fallen far short of expectation. The fact, however, is that the workers and the agencies for the blind in Europe and America have kept up this ideal in the forefront and are determined to take more accelerated and effective strides towards it.

Except for a few important details which will be noticed later, the basic principles of vocational guidance of the seeing are equally applicable to the blind. It is, therefore, perfectly relevant to state here the inseparable constituents of the concept of vocational guidance.

What is Vocational Guidance.—Vocational guidance has been defined variously by the writers on this subject in conformity with the emphasis they have laid on one or other of its different aspects. The definition which seems to adhere to the consensus of opinion is that vocational guidance is "the process of helping an individual 'to select, prepare for, enter upon, and progress in' an occupation." In other words, voca-

tional guidance comprises: (i) Counseling (with a view to assist an individual in selecting a vocation or vocations in consonance with his abilities and interests); (ii) Training (for the said vocation or vocations); (iii) Placement (in the said vocation or vocations); and (iv) Follow-up.

It is, thus, obvious that vocational guidance is to be carried on for a number of years, starting from the selection of a suitable vocation or vocations, and ending with satisfactory and conscientious follow-up. The actual length of time varies in accordance with individual cases—their abilities, interests, opportunities of training, occupational possibilities existing in a particular country, and so on. The popular conception that vocational guidance ends after a few interviews with an individual and after scoring the results of certain tests administered to him, is wholly erroneous.

Task of the Vocational Counsellor.—The success of vocational guidance programmes is largely dependent on the personality and ingenuity of the vocational counsellor. This is particularly true of the counsellor engaged for the blind. The sightless adolescents have, on the average, less initiative and interest in their work than their seeing compatriots. The visual handicap by itself is not responsible for this sluggish and irresponsible state of mind, but it is brought about and accentuated by a combination of several other factors. Sometimes, blindness and mental retardation are the concomitant effects of the same underlying cause. Most often, however, the social situations arising out of the visual handicap lead to an arrested condition of the mind. Words of despair,

discouragement and depression are dinned into the ears of sightless persons by their parents and other well-meaning individuals, and it is only natural that these words will have their inevitable reactions on the minds of the blind persons.

The all-found system of maintaining visually handicapped boys and girls in special residential institutions does not also foster among them an urge towards self-support. In course of time, they come to believe that the world owes them a living even when they are out of the institution and that they have no desperate need of earning a living for themselves. This type of approach to life problems is evidently antagonistic to personal efforts and ambitions, and it tends to turn the otherwise capable blind boys and girls into permanent and despicable social parasites.

It is thus apparent that most of the maladjustments of the blind result from the social situations arising out of the lack of vision and not from the physical handicap itself. The vocational counsellor must be a person who has the adequate training and ability to eradicate all these avoidable evils. He must be a staunch and genuine believer in the successful future of the blind and must be able to inspire them to put forth their best efforts towards complete social efficiency. He must have a cheerful and radiant disposition so that he may be able to instil hope, courage and self-confidence in them in spite of their visual handicap. He must make them believe sincerely that blindness is just an inconvenience and not a tragedy; that blindness is nothing more than an individual difference, such as, colour of the skin, stature, and so on; and that all the individual differences in the world may be moulded and utilised towards the enrichment of the common social end.

At the same time, the vocational counsellor must be on his guard so that he may not arouse unwarranted ambitions in the minds of the blind—ambitions which cannot be fulfilled in the present state of society.

The sightless boys and girls, like the seeing of the same emotional age, often choose a vocation followed by another, for whom they have a good deal of glamour and admiration. This type of choice, when it is not supported by the reliable and objective findings of one's abilities, should be discouraged by the vocational counsellor. He should supply a complete list of the occupations for which the blind are and should be eligible and provide full information about each occupation. This, of course, does not imply that the blind should not venture out on a new vocation just because it has not been tried out successfully by any one else, and they should always be prevented from sailing across the "uncharted seas." They should be encouraged to do so by all means, provided they are made aware of their physical limitations in relation to the occupation they intend to try out and that their abilities and interests justify the experiment. Otherwise, the vocational counsellor will not be discharging his duties and responsibilities faithfully and he will merely cause keen disappointments for his blind counselees, making, thereby, the miseries of blindness appear to them far more unjust and unbearable than before.

Obviously enough, the vocational counsellor should be thoroughly conversant with the abilities and interests of everyone individually. The attempt to select occupations for groups of people is unsound and is doomed to failure. Vocational guidance must, of necessity, be always based on the individual and none of the strong or weak points of the counslee must escape the vocational counsellor. The relationship between the counsellor and the counslee must be one of great confidence and cordiality so that the individual characteristics of the latter may be judged by the former in the right perspective.

It is a colossal psychological mistake to proceed on the assumption that the blind constitute a class by themselves and that there are certain categories of vocations

suitable for each belonging to this class. Several vocational guidance programmes have failed on account of this belief in the "class" concept of the blind. It is not an exaggeration to state that the sightless individuals vary from one another even in more important and fundamental ways than do the seeing, and these variations are due to several factors, such as, the age at which sight was lost, the cause of blindness, the amount of visual acuity retained, etc. There is hardly any common denominator for all the blind individuals other than their blindness; and sightlessness by itself cannot distinguish a number of persons as a class, at least for psychological and vocational purposes.

The abilities and interests of the individual counsellee must be determined objectively and not by means of hypothetical postulations. A mere guess or even a deduction about one's vocational abilities and preferences, no matter how correctly it is formulated at times, cannot be assigned the status of the objective data obtained from the results of the approved psychological and psychometric tests. The tests of intelligence and achievement are, by their very nature, indicative of one's intellectual attainments and these tests determine, at least, one's capabilities for literary, and a number of what are described as, persuasive professions. But mechanical aptitudes and preferences for the so-called vocations cannot be determined by the test of intelligence and achievement. Unfortunately, these are the only tests which have been adapted for use with the blind, and there is hardly any reliable adaptation of tests to discover their mechanical aptitudes and vocational preferences. It is of urgent importance that such tests be devised or adapted for the blind inasmuch as the majority of them have to follow vocations other than those grouped under the category of literary and persuasive professions.

Personality of the Blind.—Another point which should find a conspicuous place in the

vocational guidance programmes is the stress on the personality development of the counsellee. No vocational guidance can be regarded as complete and effective unless it includes the guidance towards the development of a normal and pleasant personality. It is a matter of common knowledge that an individual, with undesirable personality traits, often fails to achieve vocational success despite his thorough training in a particular occupation. The combination of an efficient training and a winning personality is indeed a sure guarantee of a satisfactory vocational adjustment in life, and the vocational counsellor must place this ideal before the counsellee from the very outset of the vocational guidance undertaking.

It is, however, discouraging to have to admit that the reliable literature on tests and inventories of personality is still very limited and, so far as the blind are concerned, the volume of such literature is almost negligible. But the question of the personality of the blind is of supreme moment as the lack of vision tends to accentuate and emphasize certain disagreeable personality characteristics. A few of these have already been stated very briefly in a foregoing paragraph. For limitation of space, only one more which requires careful and persistent guidance, is mentioned here.

Mannerisms.—It is often observed that some blind persons have developed certain peculiar mannerisms, such as, swinging their heads, sticking fingers into their eyes, smiling in a vacant way, moving their hands before their eyes, etc. In the psychology of blindness, these queer traits are known as "blindisms." Three chief reasons may be advanced to account for these habits:—

First, owing to the absence of vision, sightless children are incapable of learning the simple ways of life through visual imitation, which the seeing children absorb almost unconsciously. Unless the blind children are told about the correct ways, they contract certain traits of their own without knowing that these traits are pecu-

liar to themselves and are not possessed by others.

Secondly, many sightless children as well as adults are constrained to live enforced sedentary lives on account of the obvious difficulties of shifting about freely and of the consequent lack of physical activity. This results in the conservation of a good deal of energy—both physical and mental—on the part of the blind, and this superfluous energy manifests itself in the unnecessary movements of the body.

Lastly, the visually handicapped boys and girls, with some amount of residual vision, are very often tempted to convince themselves that they have not lost their small possession. This process of self-conviction accounts for the habit of moving their fingers before their eyes and other quaint mannerisms.

It is hardly necessary to point out that these unsightly physical manifestations should be handled with care and tact with a view to their ultimate eradication. Tact is of immense importance, else, the cure of one disease, if at all successfully accomplished, is likely to lead to the inception of another, viz., the complex of inferiority. The process of correction should commence within a short time after an instance of blindness has been noticed; otherwise, it will be very difficult to remedy this severe maladjustment with a satisfactory measure of success. Parents and teachers have a great responsibility in this matter; but the responsibility of the vocational counsellor is the greatest in view of the fact that these symptoms of maladjusted personality have a direct and important bearing on the vocational success of a blind individual. However, all sightless persons do not acquire these personality imperfections, and the vocational programme will, therefore, include only those who have done so in some form or another.

Training.—So far as the second item of vocational guidance, viz., training, is concerned, it may be stated that the training imparted to the blind has usually to be more

thorough and more protracted than that provided to the seeing. It has to be more thorough as the seeing people in general and the seeing employers in particular are not, as a rule, inclined to believe that the blind can be trained as efficiently and adequately as those with sight. To put it differently, the training of a seeing person is accepted as a matter of course, and this assumption is rebutted only when his training is found to be inadequate in course of time. But the case is different with a blind person; the onus of proof that he has received a good and useful training is usually on him.

Again the training of the blind is, generally speaking, spread over a greater number of years than that of the seeing. This is due, firstly, to the fact that the training of the sightless individuals has, as stated before, to be more thorough; and, secondly, due to the visual handicap itself which necessitates a greater length of time in some cases. It should be borne in mind that, for a seeing person, certain occupations do not call for any long-drawn process of training at all; sight, combined with some degree of commonsense, is all that is necessary to qualify him for these occupations. But no such gainful vocation is known to exist for an individual without sight.

The vocational teacher, like the vocational counsellor, must be a very capable and resourceful person. He must be able to engender the belief in the minds of his sightless trainees that their training will be valued by the employers and that they will not remain idle and useless on the satisfactory completion of their course. He must also be able to make special adjustments required to teach his sightless pupils. Without these adjustments, the blind trainees can never master the occupations which are, after all, primarily intended for the seeing.

Placement of the Blind.—According to authorities, placement is not included in the concept of vocational guidance. But the

more recent tendency which appears to be in close harmony with what will be stated in the subsequent paragraphs, is to regard placement as an integral part of a vocational guidance programme.

Placement is indeed the hardest element of any system of vocational planning, and it is particularly so, so far as the blind are concerned. It has already been mentioned that the seeing employers are usually suspicious about the abilities of a sightless person and are, therefore, reluctant to hire his services. Two distinguishable stages of this suspicion of, and prejudice against, the employability of a blind individual may be noticed: first, it is not believed that a person, having such a major handicap of blindness, can really receive a thorough and complete training in any occupation; and, secondly, it is not conceded that he can put his training to a commercially useful purpose, even if a good training is possible for him.

A suspicion or a prejudice has hardly any logic behind it; once it has been implanted, it deepens hard and flourishes even after the real or the supposed reason on which it is based, has ceased to operate. A brief analysis of the pertinent problems affecting the blind will bring out this point in bold relief.

There was a time when almost all the blind individuals throughout the world were unfit for placement in over 99% of the vocations in existence. The visual handicap by itself was not responsible for this deplorable state of affairs, but the real cause was that the people did not know how to train the mind and the hands of a blind individual towards his self-support and social usefulness. The sightless individuals were treated no better than the domestic animals, and the joys and sorrows of their lives were indissolubly linked up with the whims of those who "owned" them.

In course of time, however, social consciousness underwent a tremendous change, and respect for the personality and indivi-

dual worth of a human being grew considerably. People came to realise that it was much more profitable, from the purely economic standpoint, to train the blind in certain occupations and make them contributing members of society than to maintain them permanently at public or private cost. This was only the economic aspect of the problem; along and side by side with it, there was also a humanitarian aspect which was certainly grasped by a section of the population at large. The maintenance of the blind during their whole lives on public or private expense would defeat its ideological purpose and would dehumanize them beyond recognition. They must be made to earn their living either completely or partially and, in order to do so, necessary training must be provided to them. Besides, education or training, like virtue, is its own reward; it illuminates the minds of the blind, although their eyes are steeped in utter and unshakable darkness.

Both these economic and humanitarian aspects of the questions of the sightless individuals led Valentin Haüy to establish the first school for the blind at Paris in 1784. Since that time, schools for the blind were gradually founded in all the civilised parts of the world by those who believed in the potential capabilities of the visually handicapped children. The result has been quite encouraging—not so much in terms of quantity as in those of quality—and, thus, there are among the blind some who have proved themselves as successful teachers, professors, lawyers, journalists, Government officials, business administrators, musicians, industrial workers, craftsmen, and so on. It must, however, be admitted that the blind will welcome the increasing recognition of the economic aspect of their problems in preference to the humanitarian; inasmuch as the former is more conducive to their sense of self-respect than, and cancels the *raison d'être* of, the latter.

From what has been stated in the immediately preceding paragraph, one should

not get the impression that the employment problems of the blind have been solved satisfactorily in view of the establishment of so many institutions for sightless children and that the task of the placement agent has become a smooth sailing. Nothing is farther from the truth; else, the question of the suspicion and prejudice on the part of the employers against blind labour would not have been raised in the present context with so much poignancy. The correct reading of the present position appears to be that some seeing people, with advanced and enlightened views, have recognized the claims of the blind for suitable placements in conformity with their training and education and that some blind individuals have achieved success in certain vocations and professions. But nine out of ten employers are unwilling even today to employ persons without sight notwithstanding their acquisition of approved qualifications. This lamentable position cannot be explained by anything other than the deep-seated suspicion and prejudice on the part of the seeing people against the abilities and resourcefulness of the blind, to which reference has already been made.

All this makes the task of the placement agent a good deal more difficult than that of the vocational counsellor or of the teacher. The counsellor or the teacher has to deal only with the blind and mould their ideas and opinions; whereas the placement agent is not only concerned with the blind, but has also to bring about a transformation of the prejudicial reactions of the seeing employers to blind labour. This undertaking is indeed of the utmost magnitude, but it must be carried out effectively if the programme of vocational guidance is to be of any real value. Dr. Allen, the Director Emeritus of the Perkins Institution for the Blind, has aptly pointed out that, while in school, a blind person can do what *he thinks he can*, but, out of the school, a blind person can do what *the public thinks he can*.

In order to aid the blind individuals in

securing suitable positions, almost every large institution and agency for the blind in the Western countries has, on its staff, a placement officer who endeavours to bring about a successful understanding between a blind candidate and his employer. This distinguished band of placement officers has rendered a conspicuous service by inducing several employers in various spheres of activity to engage sightless workers. Many legislations protecting blind labourers against the competition of the seeing and providing compensatory privileges for them have been enacted as a result of the strenuous efforts of these men and others interested in the economic security of the blind. A small number of employers, including Mr. Henry Ford, have come to realise the truth that the blind employees usually work with the greatest possible conscientiousness and devotion as they are determined to rise beyond the prevailing prejudice against them; and, in order to do so, they develop certain knacks and contrivances of their own with a view to restraining or minimizing the hindering effects of their visual handicap. The employers have also been made to believe that, in certain types of occupations, the blind, with their superior concentration and firm resolution to achieve a conquest over their physical handicap in order to make a place for themselves in the world of the seeing, turn out, at times, to be even more efficient workers than those with sight.

The wider economic view that society is the ultimate gainer by employing sightless individuals rather than by keeping them in a state of unproductive idleness and by maintaining them at public or private expense, has also been realised by a section of the seeing population. This is a hard economic truism which merits frank recognition from all, without confusing it with the well-intentioned but misplaced notions of altruism and humanitarianism. The economic value of the blind has definitely been proved in Great Britain and the

United States during the present war as thousands of them have taken over and are carrying on most efficiently some of the duties relinquished by the seeing workers on account of their entry into direct military services. In "Outlines of a Scheme for the Resettlement of Disabled Persons", issued by the Ministry of Labour some time ago, the following significant statement has been made:—

"The winning of the war demands the full use of all available labour, and disabled men and women can make a valuable contribution to this and in some cases by entering the munitions industries and in other ways for work."

The man salvage clinics, established in the United States for the purpose of locating and utilizing all available labour for war services, have succeeded in placing a large number of blind persons in different types of occupations. What has been proved to be true during the war-time, cannot certainly be shown to be otherwise in the days of peace through any process of logical thinking.

The success of vocational guidance of the blind, so far as their employment is concerned, is largely dependent on the tact, resourcefulness and personality of the placement agent. As has already been shown, the population at large are not yet prepared to hire the services of the blind even if the latter have been adequately trained for their vocations. It is difficult to prophesy if the time will ever come when the blind in general will be considered fit for employment on the basis of their training and education without the intervention of a placement agent or a placement agency. It can, however, be safely predicted, from the course of events during the past century, that the employment position of the blind will be a great deal better than what it has been up till now if the vocational guidance programmes are carried on with zeal and conviction. The present public attitude towards the blind must be thoroughly trans-

formed. The seeing people must be made to realise that mendicancy, whether it is public or private in character, does not invariably follow blindness. They must learn to consider a sightless individual from an altogether different angle of vision, viz., he is not so much a *blind* person, but a *person* who happens to be blind. The placement agents or the agencies have to strive towards this goal if the vocational guidance of the blind is to be successful. Miss Helen Keller has rightly advanced this point of view in her inimitable way:—

"The public must learn that the blind man is neither a genius nor a freak nor an idiot. He has a mind which can be educated, a hand which can be trained, ambitions which it is right for him to strive to realise, and it is the duty of the public to help him to make the best of himself, so that he can win light through work."

Follow-up.—If follow-up, the last item of vocational guidance, has been regarded to be imperatively necessary for the seeing, it is still more so for the blind. It is not at all unlikely that an employer who may have hired a blind person in a state of vacillation or on persuasion of a placement agent or in view of a fitting spell of altruism, will try to get rid of the sightless worker on the flimsiest pretext and at the slightest provocation. In cases like these, the blind individual himself or the field agent on his behalf should make the best endeavours to appeal to the sympathy and justice of the employer. If there is anything unsatisfactory about the work of the blind employee, it should be subjected to correction and improvement. The field agent should follow, at least for a reasonable period of time, the career of a sightless worker, and he should have frequent interviews with the employer regarding work of the blind employee. This follow-up is indispensable for a large number of new entrants in service.

There is another class of employers who had genuine confidence in the abilities of a blind person at the time of employing him,

but who have been disillusioned after seeing him at actual work. This may be due to his lack of thorough training or some undesirable personality characteristics, which were not detected by them before. The clear duty of the field agent in such cases is to put the blind worker to a further course of required training and to help him in his personality problems. He must be made to realise the truth that he has to earn his wages in the same way as his fellow-workers with sight, without expecting any concession, leniency or charity from his employer on the ground of blindness. He should also be told that he lowers himself both as a person and as a worker before his employer if he employs his visual handicap to serve as an excuse for his irregularity in attendance, lack of alertness and unsatisfactory work. Like others, he must be prepared to perform his duties on the principle of fair play and no favour; else, no amount of follow-up will bring him the vocational success which he desires and requires.

Facts about India.—The present discourse cannot be regarded as complete unless a few words are added in order to indicate the nature of the vocational guidance programmes evolved for the blind in India. The term, "vocational guidance", postulates the existence of a number of vocations; and there has been practically no vocational guidance of the blind in this country in view of the extremely limited range of their vocational possibilities. Begging—be it open or disguised—is still the vocation most widely practised by the Indian blind. The position is so pitiable that a large majority of the sightless beggars would rather continue begging than agree to receive a useful training *free of all charges*. Strangely enough, they are encouraged and even constrained by their parents and relatives to make this unfortunate choice. This tragic situation is responsible for the fact that most of the blind institutions in India have a very insignificant number of pupils on their

rolls, although there is usually a good deal of unused accommodation left and the financially handicapped pupils are exempted from paying for their board, lodge, clothes and tuition.

A passing reference to the relevant statistics may help the realisation of the actual position about the extent of training received by the sightless boys and girls in India. According to the Census Report of 1931—that being the latest available statistical survey of the blind in this country,—the total number of sightless persons is a little over 600,000, and the number of the sightless boys and girls of schoolgoing age, i. e., who are between the ages of 5 and 15, is about 50,000. This figure is, however, considered as a colossal under-estimation by many, and it is believed that the total number of the Indian blind must be somewhere between one and two millions. This also leads to the proportionate swelling of the figure of boys and girls of schoolgoing age. For such a vast section of the suffering humanity there are about 30 schools and training centres, not counting a few asylums of a definitely eleemosynary character; and even so few training institutions fail to secure a sufficient number of pupils !

This is only one side of the picture ; the other side presents an equally dismal view. Most of these training centres are thoroughly ill-equipped for their tasks and the overwhelming majority of their teachers completely innocent of the fundamental principles of blind education and blind psychology. The inevitable result arising out of this situation is that the training provided to sightless boys and girls is never thorough and adequate.

It may better be disclosed here that the only factor of vocational guidance, which is recognised and acted upon by most of the educators and workers for the blind in India, is training. The microscopic minority, having the right view that a blind institution should take the full responsibility for the other three factors of vocational guidance,

cannot carry out their ideas for financial stringency. It is, thus, very easy to imagine the exact state of the *carriage* of vocational guidance, with one of its four wheels damaged, and the other three absolutely out of operation.

The days of complacency, about this useless and helpless state of such a huge number of blind individuals in India, who could have become socially efficient citizens through well-directed programmes of vocational guidance, should have been over a long time ago. In terms of human misery,

this condition has led to consequences beyond comprehension, and in terms of economic loss, it has also been productive of staggering results. The Government and the enlightened public should come forward to alleviate this situation not so much from the humanitarian standpoint, but from the standpoint of sheer economic considerations. Fortunately, society can compensate for the economic loss resulting from blindness among some of its members, and this can be done only through well-integrated and well-executed plans of vocational guidance.

Milk Supply to Towns

K. V. KUKDAY

While in England the supply of milk is more than is supposed to be needed for human consumption, in cow-worshipping India we do not have sufficient even for our children. Examining this paradox, Col. Sir K. V. Kukday, I. M. S. (Retired), Nagpur, makes constructive proposals for the increase of milk supply and for its proper distribution in our towns.

A dynamic programme of milk supply to towns depends a great deal on the folk's appreciation of the value of milk as an article of diet. Milk is the natural food of the young of all mammals, for a longer or shorter period following their birth. The presumption is that the natural milk is best suited for the nutrition of the young of each species of animal. This is certainly true of the human infant, which generally thrives on cow's milk.

Constituents of Milk.—The average proportion of the different constituents of human milk and that of some domestic animals are shown in the following table:—

		Water	Proteids	Fats	Carbo- hydrates	Salts
Human	...	87.4	2.0	3.5	6.5	0.6
Cow	...	87.4	4.0	3.5	4.5	0.6
Buffalo	...	81.5	4.35	8.0	5.0	1.0
Goat	...	87.5	3.7	4.2	4.0	0.6
Donkey	...	90.8	1.8	1.5	5.5	0.4

The important protein in cow's milk is casein. In milk, it is mixed with lime-salts, and gives to the milk its white colour. The fat in milk when separated, is called butter. In the natural state, it exists in milk, in extremely fine particles, and is therefore very easily digested. The carbo-hydrate in milk is in the form of a sugar called lactose. This is easy to digest, but is much less sweet than the ordinary sugar we use. Important among the salts are those of calcium, potassium and phosphorus. Milk also contains all the essential vitamins. It is not, that the milk of every cow—for example—has the above identical composition, nor that the milk of an individual cow has the same composition throughout the milking period. These vary within pretty wide limits. However, the composition of the mixed milk of a herd of cows is fairly constant. Whenever possible, it is therefore better to feed the child on such mixed milk of a herd, than on the milk of one cow alone.

In the process of digestion, milk is curdled by the gastric juice. The curd of human milk is a loose flocculent mass, easy of digestion and assimilation; while cow's

milk curdles in hard lumps, which are less easily digested. This can be seen when sometimes a child vomits after a feed. The dense clotting can be prevented by the addition to the milk of plain sterilised water, rice-water or lime-water (used under medical advice). Boiled milk also forms smaller clots than those of raw cow's milk.

Skimmed Milk.—When milk is allowed to stand for some time, the fat in it floats on the top as cream. With a cream-separator, practically the whole of the cream can be separated in a short time. The remaining milk is called skimmed milk. This skimmed milk is by no means to be despised. It still contains all the milk proteins, sugar and salts. It is very much like butter-milk from which butter is removed. Middle class people in western countries usually use skimmed milk for tea and puddings, as it is much cheaper than whole milk. Vitamin D and E which are most essential for the growth of children, are however absent from skimmed milk, as these are removed with the cream. Tinned milk obtained in the market is of two varieties, whole milk and skimmed milk. Skimmed milk has to be declared on the label. It is therefore important to read the label and see that you do not buy skimmed milk in place of whole milk. Condensed or dried whole milk is quite a useful substitute for fresh milk, when the latter is not obtainable.

Milk from a healthy animal drawn with sanitary precautions is free from germs. When exposed to air, various germs get into it, and the milk becomes sour and curdles. The Indian custom of always using boiled milk is therefore to be preferred. From boiled milk, we prepare good curd (*Dahi*) in which the sugar of milk, is turned into lactic acid. From this we prepare buttermilk and separate the butter. Some persons with weak digestion cannot digest milk. Such people can easily digest curd or buttermilk, by reason of the stomach being saved the operation of curdling.

Boiled Milk.—Natural milk contains all

the vitamins necessary for the maintenance of health. When milk is boiled for some time its vitamin content is materially reduced. On the other hand, if it is insufficiently boiled, the danger from infectious germs is not removed. To get over this difficulty the milk is pasteurised, i.e., it is kept at the fire at a low heat, at a temperature of 145°F or 65°C. for about half an hour, and then rapidly cooled. This process destroys the harmful organisms, but saves the vitamin from being burnt up by the extreme heat of boiling point. It is, however, a good rule when an infant is brought up entirely on previously heated milk to administer daily a small quantity of grape, orange, or lemon juice, so as to make up for any loss of the anti-scorbutic principles in raw milk.

Butter when kept for some days, gets rancid owing to some water and a little casein contained in it. In India, it is therefore customary to clarify butter and turn it into ghee. Ghee is pure fat and can remain wholesome for a long time. In the process of turning butter into ghee, the vitamin D is not materially lost, but most of the vitamin A is destroyed by the prolonged heating. Vegetable ghee is now largely used in India, on account of its cheapness. It is certainly fat, but it does not contain any vitamins.

Buffalo Milk.—In the absence of mother's milk, cow's milk is most often used. From the composition table of milks it will be noticed that cow's milk contains double the amount of protein, compared to human milk. To approximately humanise cow's milk, it is therefore necessary to add to the cow's milk, equal part of water, and then in addition, some cream and sugar. Now cream is extremely difficult for poor people to obtain. There is a prejudice against the use of buffalo milk for infants; but from the composition table it will be seen that if we add equal part of water to buffalo milk, and then a little sugar, its protein, fat, and sugar content is almost the same as human milk. The need for adding cream

П.

Ryan, Arthur J.

Date Due

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IRON				WIDE				THICKNESS					
IRON				WIDE				THICKNESS					
1823	9	inches	7	inches	3/8	inch	1529	12	inches	10	inches	3/8	inch
1824	10	inches	7	inches	3/8	inch	1530	12	inches	9 3/4	inches	3/8	inch
1826	9	inches	6	inches	3/8	inch	1852	13	inches	15	inches	3/8	inch
1836	9 1/2	inches	7 3/4	inches	3/8	inch	1913	14	inches	11	inches	3/8	inch
1867	10 1/2	inches	7 3/4	inches	3/8	inch	1984	16	inches	12	inches	3/8	inch
1878	11	inches	8	inches	3/8	inch							

Other sizes made to order.

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